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JAPANESE SCANDINAVIAN RADIOLOGIC SOCIETY
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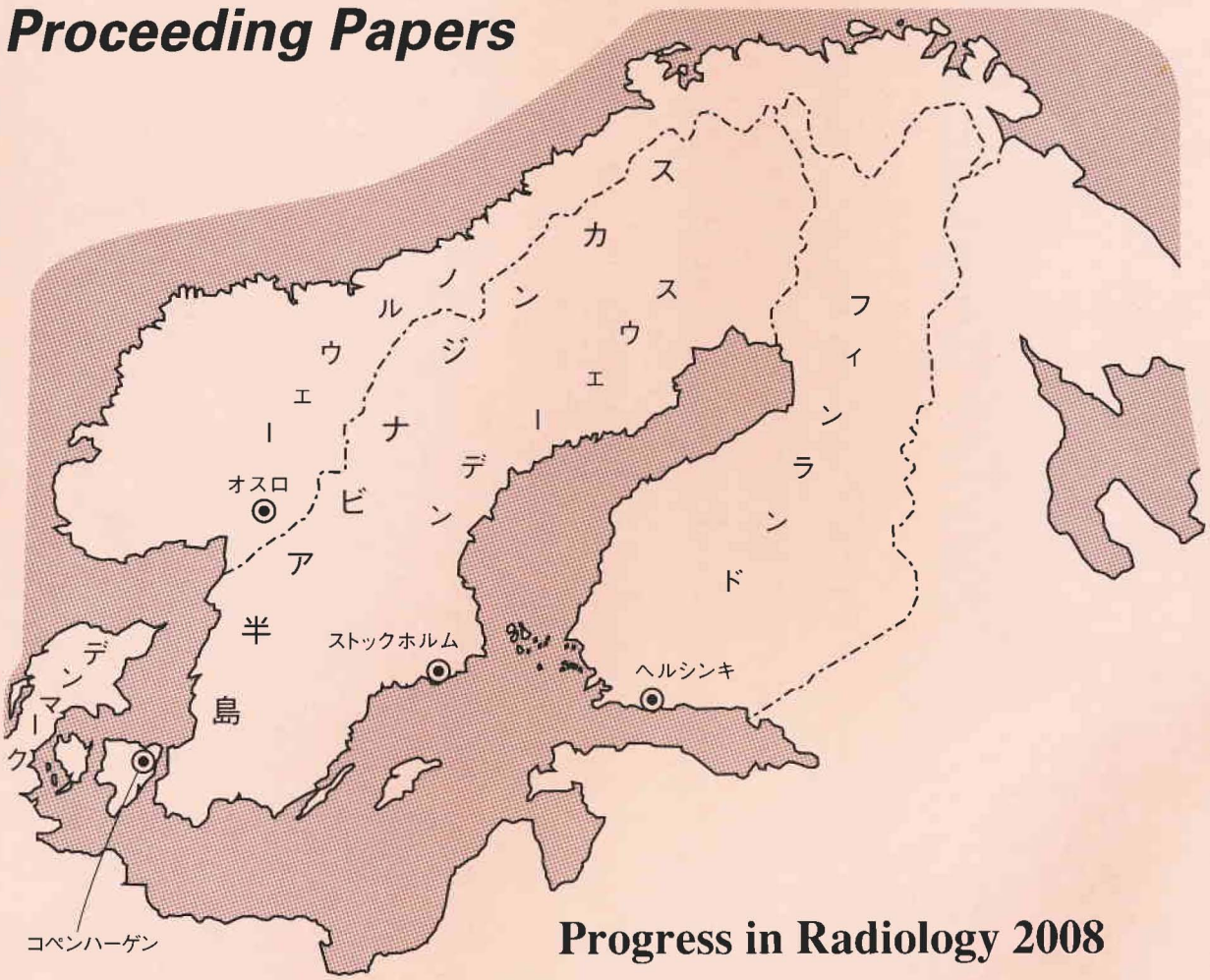
Progress in Radiology 2008

Proceeding Papers



Progress in Radiology 2008

Joint meeting of
the 7th Symposium of Japanese Scandinavian Radiological Society,
10th Nordic Japan PACS Symposium, and
19th Symposium of Kinemato-Dynamic Digital Imaging in Medicine

Tokyo, September 26-28, 2008

Sep 27(Sat.)

Opening Remarks **09:00-09:05** **Hiroyuki Tajima**

Session 1. **09:05-09:35**
Intervention **Moderators: Y. Korogi and N. Albiin**

1: Impact of superselective high dose cisplatin infusion therapy for maxillary cancer with orbital invasion

Masafumi Kanoto
Department of Radiology, Yamagata University, Yamagata, Japan

2: Usefulness of percutaneous angioplasty in the patients of clitical limb ischemia

Tomoyasu Sato[1)], Kayo Okahara[2)]
[1)]Department of Radiology, Tsuchiya general hospital, Hiroshima, Japan
[2)]Department of Dermatology, Tsuchiya general hospital, Hiroshima, Japan

3: Effect of intra-annular thermal therapy in treatment of chronic discogenic low back pain

Per Kristian Hol, Gunnvald Kvarstein, Leif Maawe, Randi Digernes, Bjoern Tennoe, Audun Stubhaug, Tor Inge Toennessen, Harald Breivik
The Interventional Centre, Department of Anestesiology and Department of Radiology, Rikshopitalet, Oslo, Norway

Session 2. **09:35-10:05**
Mobile system **Moderators: T. Okabe and A. Aslaksen**

4: Digital X-ray services on a mobile wireless platform, for elderly in nursing homes

F. Laerum[1)], J.C. Hellund[2)]
[1)]Rikshospitalet University Hospital, Oslo, Norway
[2)]Ulleval University Hospital, Oslo, Norway

5: Introduction of In-vehicle digital X-ray systems in Japan

Motoyuki Omori
X-Ray Business Marketing Division, Hitachi Medical Corporation, Japan

Special Lecture 1 **10:05-10:35**
Moderator: T. Kushihashi

Evolution of PACS for multi-center image management and personal health record

Seong K. Mun, PhD
ISIS Center, Department of Radiology, Georgetown University Medical Center, Washington, DC, USA

Coffee break **10:35-11:00**

Session 3. **11:00-12:00**
PACS **Moderators: H. Fujita and S. Olsson**

6: Analysis of out-patient flow line in Gifu University Hospital

Yasutomi Kinosada
Gifu University Graduate School of Medicine, Department of Biomedical Informatics
United Graduate School of Drug Discovery and Medical Information Sciences Division, Gifu, Japan

7: Implementation of an integrated teleradiology system in western Norway
-Technical, administrative and clinical aspects-

Aslak Aslaksen[1], Sverre Størkson[2]
[1]Haukeland University Hospital and University of Bergen, Norway
[2]Regional Health Authority in the West of Norway, IT Division, Norway

8: A remote imaging system by the NPO juridical person whom the radiologists belonging to the university hospital established -the present conditions and future prospects-

Masahiko Fujii, Kazuro Sugimura
Department of Radiology, Kobe University Hospital, Hyogo, Japan

9: The multimedia, virtual MR imaging department

F. Lærum[1], P.B. Marthinsen[1], J. Hald[1], R. Bergstrøm[2], D. Christensen[1], H. Roterud[1], J. Jakobsen[1]
[1]Rikshospitalet University. Hospital, Oslo, Norway, [2]KITH, Trondheim, Norway

10: Application of homecare EHR with PACS to disaster medicine

Hiroshi Kondoh[1], Kei Teramoto[1], Wakoto Akinaga[2], Takeshi Washiashi[3], Shiro Koge[4]
[1]Tottori University Hospital, Tottori, Japan
[2]NEC TOSHIBA Space Systems Ltd., Japan
[3]Enterprise IT Solutions Healthcares Division Agfa-Gevaert Japan, Ltd., Japan
[4]Egg Co. Ltd., Japan

Special Lecture 2 **12:00-13:00**
Moderator: H. Nishitani

Concept and clinical aspect of 320-row area-detector CT

Kazuhiro Katada
Department of Radiology, Fujita Health University, Japan

Break **13:00-13:30**

4: Digital X-ray services on a mobile wireless platform, for elderly in nursing homes

F. Laerum[1)], J.C. Hellund[2)]
[1)]Rikshospitalet University Hospital, Oslo, Norway
[2)]Ulleval University Hospital, Oslo, Norway

The population of elderly in nursing homes (NH) is increasing. In autumn 2004, mobile X-ray service was implemented in Oslo, Norway, for diagnostic X-ray in NH. A simple X-ray unit equipped with a digital detector is transported to NH on demand, using a wheel-chair ramp equipped with a car. Examinations are performed in the residents' room. From having images brought by USB-disk to the radiology department for interpretation and reporting, we have recently started image file transmissions directly from the X-ray equipment to the PACS-system of the hospital via 3G mobile net. Typical transmission duration times for a set of three images is 20-30 sec.

The use of the service is increasing, with >2,600 examinations in 2400 examined patients since the outset.

Image quality, assessed by VAS scale, was not significantly different from controls taken with a fixed X-ray unit. A resolution of 3.2 lp/mm and exposure deviation from nominal of 0.12% was found. A survey revealed that tentative diagnosis verified in 58%, invalidated in 42%, with consequences to therapy in 85% and nursing in 71%. About 10% had no alternative to the service; 8% had to be hospitalised following the examination. Expensive and exhausting patient transportation with ambulance or taxi, or hospitalisation, were avoided in 90% of cases. Distribution of examinations includes chest 16%, extremities 32%, pelvis/hip 45% and spine 7%. Panorama of findings is found to be normal 18%, osteoarthritis 24%, prosthesis control/old fracture 28%, prosthesis failure 3%, pneumonia 3%, heart failure 8%, fracture 12% and others 4%.

Digital technology can improve health services to the elderly population. A mobile radiological service gives less distress for the patients, reduces expenses to transport/staff and increases diagnostic accuracy in the NH. Image quality is found adequate.

5: Introduction of In-vehicle digital X-ray systems in Japan

Motoyuki Omori
X-Ray Business Marketing Division, Hitachi Medical Corporation, Japan

In Japan, the guideline of Ministry of Health, Labour and Welfare recommends to apply X-ray radiographic images for lung cancer, stomach cancer, and breast cancer screening. Check-ups are done not only in hospitals and check-up centers. It is not rare to visit community centers, nursing homes or business offices with In-vehicle X-ray system, for the purpose of improving community service or regular check-ups for employees. Since Hitachi Medical Corporation introduced In-vehicle Digital X-ray system for stomach examination in March 1992, many other makers are following us with their In-vehicle Digital X-ray system for stomach, chest, or breast. These systems have been a great support of medical check-up market.

Now, we would like to introduce the line-up of In-vehicle Digital X-ray systems, the merit of using systems and their unique ways of organizing patient images.

Yasutomi Kinosada
Gifu University Graduate School of Medicine, Department of Biomedical Informatics
United Graduate School of Drug Discovery and Medical Information Sciences Division,
Gifu, Japan

In accordance with the development of hospital information system, the volume of clinical and administrative data have kept increasing explosively. Therefore, the secondary use of these data are eagerly desired to explore the additional values of the system. The aim of this study is to make the most use of out-patient flow line data which were collected by using the sensor network system in our university hospital. In my presentation, I will show the relationship between the hours of stay in out-patient department and the results of flow-line analysis of out-patients who visited the radiological department for examinations.

On the 1st April, 2008, Japanese Government indicated a policy of rapid diagnosis to out-patients who undergo blood or radiological examinations. That is, when the report is made and explained to a patient on the same day as the examination date in case of blood test and until the following day in case of radiological examination, we can receive additional medical service fees. This policy means that the laboratory information system (LIS) or the radiological information system (RIS) and PACS must be introduced and used effectively for out-patients. As a consequence, we have to pay attention not only to the introduction of IT systems but to the IT development with emphasis on effect and efficiency.

The author analyzed the out-patient flow line data by using a process mining technique and got the good result of effective use of RIS and PACS in our hospital. The combination of the RIS/PACS system and a process mining technique is a powerful tool to streamline the radiological work flow and to evaluate its effectiveness.

6: Analysis of out-patient flow line in Gifu University Hospital

Yasutomi Kinosada
Gifu University Graduate School of Medicine, Department of Biomedical Informatics
United Graduate School of Drug Discovery and Medical Information Sciences Division,
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7: Implementation of an integrated teleradiology system in western Norway -Technical, administrative and clinical aspects-

Aslak Aslaksen[1], Sverre Størkson[2]
[1] Haukeland University Hospital and University of Bergen, Norway
[2] Regional Health Authority in the West of Norway, IT Division, Norway

The Scandinavian countries are in the forefront in the implementation of PACS and RIS systems. Thus in the western health care region of Norway, with a population of 1 mill, all hospitals had installed PACS-RIS systems from 2002. However, sending and retrieving PACS/RIS information between hospitals has up till now been a cumbersome and complicated process with many manually routine steps including sending RIS information by telefax.

Therefore, in 2003 the board of the health care region of western Norway decided to launch a teleradiology project with the aim to simplify the exchange of PACS/RIS information between hospitals. At that time no concept for the exchange of PACS/RIS information existed, so the project decided to contacted the IHE (Integrating the health care enterprise) to develop a comprehensive model for the exchange. In 2004 the IHE developed the XDS-I model for the purpose of exchange of PACS/RIS information.

However no system for integrating PACS/RIS information was yet commercially available, so we contacted several vendors for assistance. Agfa Health Care was chosen as a commercial partner for the project.

The development process has been delayed and new deadlines have been set during the project. In June 2008, approximately 5 years subsequent to the initiation of the project, a solution is ready for clinical use. The paper will present the technical and organizational solutions and clinical utilization and discuss why integration projects are so difficult and time consuming to develop and implement.

8: A remote imaging system by the NPO juridical person whom the radiologists belonging to the university hospital established -the present conditions and future prospects-

Masahiko Fujii, Kazuro Sugimura
Department of Radiology, Kobe University Hospital, Hyogo, Japan

The business of our NPO started from March, 2005, and more than 3 years passed. We report the present conditions of our remote imaging business and the future prospects.

The following are the advantages that a radiologist working in university hospital manages a remote imaging business.

(1) Being easy to build a relationship of mutual trust so that this business consists of it in university hospital and affiliated hospital.

(2) Can supply a diagnostic radiologist continuously.

(3) Each radiologist interprets radiological image of each specialized field mainly.

(4) Available as data for the education of a medical student and resident.

The following are the present problems of our system.

(1) It became gradually difficult to maintain a relationship of mutual trust by the change of the radiologist

(2) It is difficult to find a radiologist enough for the period of the academic meeting.

(3) The interpretation work of the image except the specialized field tends to be late.

(4) Because the request number of the interpretation increased, it is not possible to maintain quality of the interpretation enough.

The following are the advantages that the NPO juridical person performs this business.

(1) Can manage it based on our free will

(2) Can increase an honorarium, costs of equipment, and contribution to the university hospital by compressing the operating cost.

The following are the present problems of the NPO system.

(1) There are some limitations for the business development of the NPO system

(2) A quick correspondence is difficult, because an approval at the board of directors of the NPO is necessary for the change of the management solution.

For the future prospects, we prepare the workspace using the internet environment, where a woman doctor during a child care period and a retired radiologist can show their diagnostic ability.

9: The multimedia, virtual MR imaging department

F. Lærum[1], P.B. Marthinsen[1], J. Hald[1], R. Bergstrøm[2], D. Christensen[1], H. Roterud[1], J. Jakobsen[1]

[1]Rikshospitalet University. Hospital, Oslo, Norway

[2]KITH, Trondheim, Norway

Purpose: Evaluate the use of integrated online PACS/RIS and multi-channel HDTV videoconferencing for running multiple remote MR-laboratories.

Methods and Materials: Lack of peak competent MR-radiologists may be a temporary or permanent problem in some hospitals. Special diagnostic problems or critical time windows for onset of therapy may require special competence and direct communication between physicians, including simultaneous interpretation of MR images. Instead of using conventional teleradiology, we established a solution with online multi-vendor PACS/RIS and simultaneously open videoconference to several MR laboratories located in remote hospitals. A studio has been established inside our department, with a four-channel HDTV videoconference-system to allow direct communication between the MR-radiographer and the radiologist. The remaining three channels were used for a document camera, a patient camera and a camera for communication between the remote clinician and the central radiologist.

Results: Several technical problems had to be solved during the setup process, to get the system feasible. Once running, the bi-directional multichannel-HDTV videoconference and the integrated PACS/RIS gave a recognizable environmental setting for communication, almost as if the central radiologist was present at the remote department. The images to be read were of high quality, and one could get access to and switch between different remote MR-laboratories.

Conclusion: The intention to ease the access to highly competent MR-expertise in centralised institutions may be achieved in our virtual MR imaging department. Utility and efficiency will be discussed.

10: Application of homecare EHR with PACS to disaster medicine

Hiroshi Kondoh[1)], Kei Teramoto[1)], Wakoto Akinaga[2)], Takeshi Washiashi[3)], Shiro Koge[4)]
[1)]Tottori University Hospital, Tottori, Japan
[2)]NEC TOSHIBA Space Systems Ltd., Japan
[3)]Enterprise IT Solutions Healthcares Division Agfa-Gevaert Japan, Ltd., Japan
[4)]Egg Co. Ltd., Japan

As a solution of digital divide in the isolated places among the mountains and isolated islands in Japan, we started the study of home care EHR system via Internet and the satellite communication in 2002. We developed a new system on the satellite communication and had the experiences of home care assistance for twelve months. As it was also considered to be useful at disaster medicine, we modified the system and participated prefectural disaster drill.

System Development: we developed the home care EHR system with PACS (Web-1000 Agfa Ltd.) and ICU monitoring system. It has four functions. The first is TV conferencing, the second is monitoring of PaO_2, heart rate, ECG and blood pressure, the third is PACS and the forth is EHR. We also developed DICOM image Up-loader and Receiver. The Up-loader on home care PC sent selected images to Receiver with https protocol through Internet. The Receiver has a web server application on the server, which gets DICOM images by cryptic protocol https and send DICOM images to Web-1000. So we could send DICOM images from home to DICOM server through Internet safely. The web-based PACS also supported the cryptic protocol and could sent images to doctors widely, easily and safely. For the application to disaster medicine, we modified it smaller and added wireless network equipment and battery supply.

Materials: Portable X-ray equipment (Canon Co.) and ultrasound (Titan) was used at home care and the participation of the disaster drill.

Results: The images and demographic data could be sent precisely. Participation of disaster drill showed possibility and validity. Doctors of hospital got the bedside monitoring data and X-ray and ultrasound image and suggested for the patient first-aid station.

Conclusions: The newly developed home care EHR with PACS and monitor system showed possibility and validity for disaster medicine.